

TANK NOTES

STATE OF
NEW MEXICO
ENVIRONMENT
DEPARTMENT



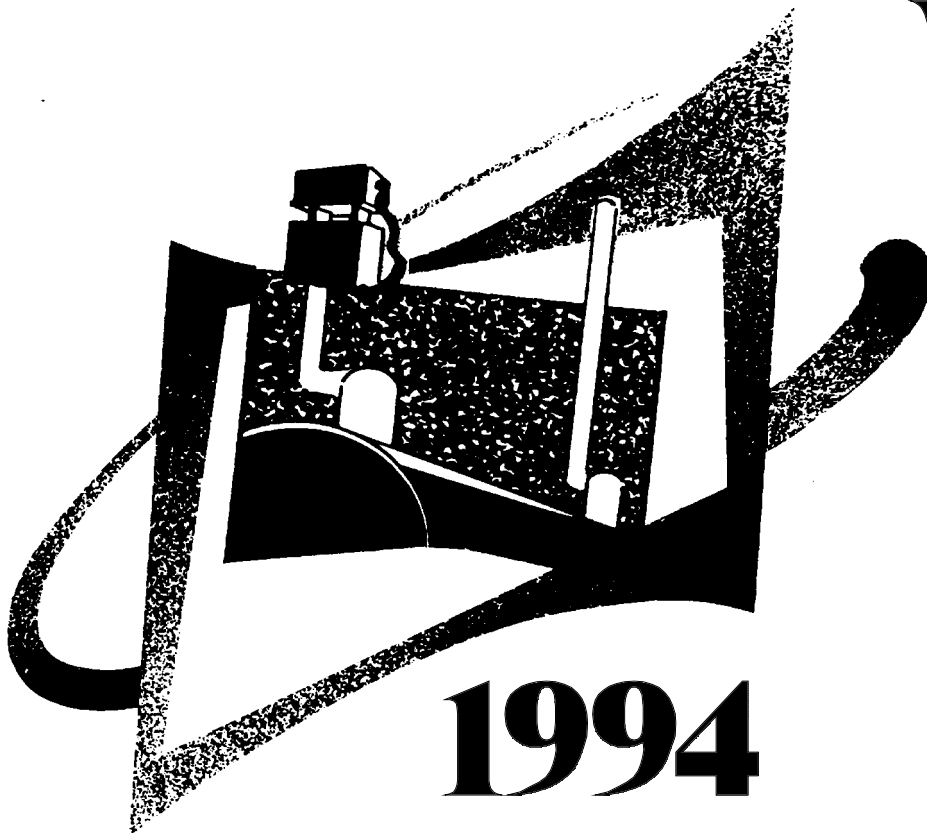
... A Newsletter from
the Underground
Storage Tank Bureau

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The Conference



We want to thank all of the speakers, exhibitors, participants and staff who contributed to the success of the New Mexico Underground Storage Tank Conference and Trade Show. Because of the wealth of information presented, we decided to delay this issue so we could share the information with those of you who couldn't attend or who missed some sessions in favor of others. We packed what we could in this issue. Watch for the winter issue for more on tank management, upgrades, and financial responsibility.

*A Quarterly Newsletter of the
Underground Storage Tank Bureau, New
Mexico Environment Department*

TANK NOTES

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NMED Secretary
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The information in this newsletter is directed at the UST owner/operator population and is provided as a general information guide. It is not intended to replace, interpret or modify manufacturers' protocols, or the rules, regulations or requirements of local, state or federal government, nor is it intended as legal advice.

Thank you for your interest in *Tank Notes*. We welcome your comments and suggestions. Send address changes and correspondence to: New Mexico Environment Department, Underground Storage Tank Bureau, Harold Runnels Building, 1190 St. Francis Drive, P.O. Box 26110, Santa Fe, New Mexico 87502

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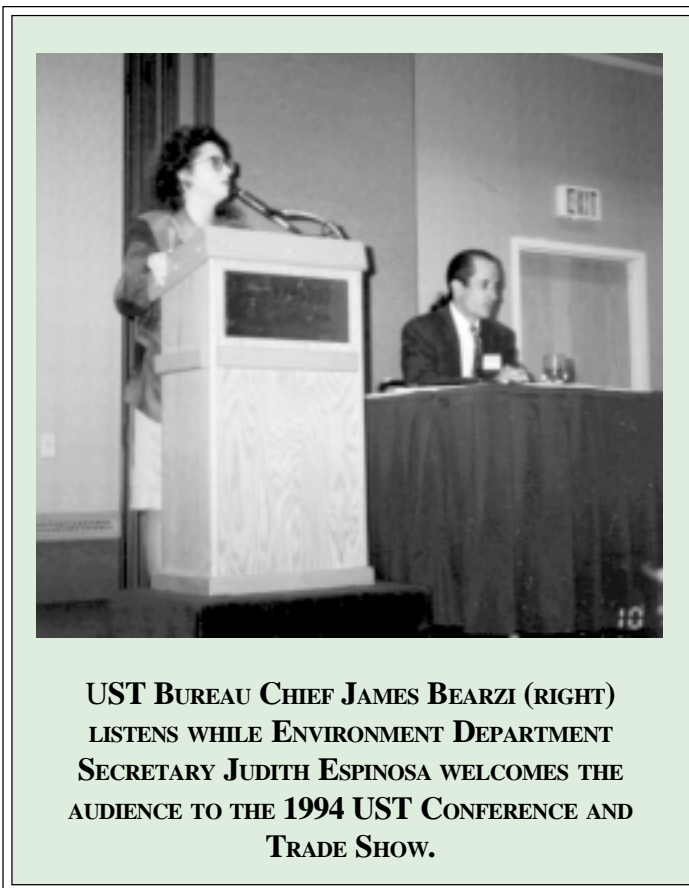
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INSIDE THE UST COMMITTEE • NEW FACES

Plenary speakers praise NM UST program

by Betsy Hovda

UST Bureau Chief James Bearzi kicked off

the conference by looking back to the first state UST conference in April 1989. What is now a bureau was just a program with a few people, a new set of regulations and a young newsletter. The program is now the Underground Storage Tank Bureau. The Bureau is well-staffed, *Tank Notes* goes to 4,000 people, and the regulations are firmly in place. Staff supervises the investigation and cleanup at numerous leaking underground storage tank sites. The inspection program has also been put in place since the last conference. Field inspectors are able to issue field citations and use expedited enforcement. Bearzi said that the regulated community is smaller, has fewer tanks and facilities, and has much higher compliance rates with the regulations. "The compliance rates with the technical standards on release detection were probably not even 20 percent," James said. "Today, New Mexico enjoys a 93 percent compliance rate, which goes a long way toward prevention." Meanwhile, the Bureau has dealt with, or is dealing with, a total of 1,600 reported leaks, half of which have been cleaned up.



UST BUREAU CHIEF JAMES BEARZI (RIGHT) LISTENS WHILE ENVIRONMENT DEPARTMENT SECRETARY JUDITH ESPINOSA WELCOMES THE AUDIENCE TO THE 1994 UST CONFERENCE AND TRADE SHOW.

A clean environment is good business. Good business is a clean environment.

Judith Espinosa, Secretary of the New Mexico Environment Department, praised the business sector for its cooperation, assistance, and patience while the UST program evolved into one of the Department's largest and most important programs. She applauded the business community's understanding of what it takes to operate underground storage tanks in an environmentally sound manner. "We've all done a lot of work over the last several years to

get leaking underground storage tanks out of the ground to protect our underground water," Espinosa said. "We've done it with new technology, with new tanks, and with new abilities to monitor them."

The Secretary commended the regulated community on its high compliance rate with the UST regs. Espinosa encouraged the attendees to contribute ideas on how to achieve sustainable development. "We want to balance the work we're doing in environmental protection with what we need to do in economic development to preserve our small busi-

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nesses," she said. "This program has gone a long way to do that."

Future plans for the program include a transition from remediation to prevention. Corrective Action Fund monies are being spent on cleanups as fast as the money comes in. As cleanups are completed, the Bureau will turn its attention increasingly to pollution prevention.

OUST's Head Fed Says New Mexico Tops

The Environment Department was honored to have David Ziegele, Director of EPA's Office of Underground Storage Tanks in Washington, D.C., as a keynote speaker.

Ziegele discussed the national program, how New Mexico fits into the national picture, and possible future trends in the program. He said he likes to come to New Mexico because this state "is a national leader. New Mexico is out in front with creative solutions to what are some terribly difficult problems in this program." In the U.S., there are about 1.2 million tanks in the ground; some 900,000 have been taken out of service. Of the 1.2 million tanks, industry estimates that about 400,000 meet standards. "That means 800,000 are unprotected and have to be upgraded or pulled," Ziegele said. "Of 260,000 releases, about 101,000 cleanups have been completed."

Forty-six states have state funds similar to New Mexico's Corrective Action Fund, and 36 of those funds have been approved as financial responsibility mechanisms. "Many are having problems of one kind or another, or they will soon," Ziegele said. "Costs in many states are a concern. Again, New Mexico is out in front for its innovation in cost control. You've also been one of the most open to new technologies." New Mexico is one of the first in risk-based corrective action. The state fund appears to be in good shape and enjoys good management.

New Mexico was the second state to get EPA approval to administer its UST program. New Mexico was the first state using field citations. "After New Mexico did it and made it work," he said, "EPA regions and other states noticed and started doing it, too."

Ziegele predicted that after 1998, with new tanks and clean sites, the private insurance market should offer affordable pollution liability insurance.

He said what would be said many times over the next two days: There will be no extension of the 1998 upgrade deadlines.

Beyond trends, Ziegele outlined needs for the future. These include putting tools in place for faster and better decision-making in corrective action. Risk-based corrective action will become crucial. Better site assessments will allow faster decisions. There will have to be acceptance and use of better technology. "We're moving away from digging up soil and hauling it away," Ziegele said, "as well as pumping and treating groundwater."

Prevention will play a big role. In the regulated community this will require good tank management to prevent releases. The underground storage tank community needs educated owners and operators. This will require a lot of face-to-face interaction between regulators and tank owners and operators. "We've all got a lot to do between now and 1998 to get tanks in shape for the long run."

A Jobber Speaks Out



Martin Porter, President of Porter Oil and President of the New Mexico Petroleum Marketers Association, is a third generation jobber. Petroleum marketers, or jobbers, are the middlemen between the refinery and the consumers. According to Porter, when federal regulations started coming down in the early 1980s, jobbers realized they were in a precarious position. Their entire business consisted of real estate and underground tanks on which they couldn't borrow money because of contamination risk, and on which they couldn't get insurance for the same reason. "We needed regulations that would clean the environment," he said, "and at the same time not punish hard-working business people attempting to comply and do a good job." Sen. Walter Bradley carried the bill that would become the Ground Water Protection Act. "GWPA provides solutions to the problem; it's self-funding; it provides dollars for cleanup; it gives direction," said Porter. "Leaks are looked at as a hazard of the gasoline business. Our regs provide guidance, controls and solutions." Porter had high praise for the UST program for being run like a prudent business, "not typical government where you throw money at a problem and bog down in red tape."

Betsy Hovda is a Geologist at the District I office in Albuquerque.

Getting down to business

A history of the UST program, 1998 upgrades, and a tank owner's perspective set the tone for things to come

by Teri McMillan

Ron Curry, Deputy Secretary of the Environment Department, opened the second plenary session at the conference with a history of the UST program and a report on the audit of the Corrective Action Fund. Curry said that overall the Environment Department and the UST Bureau have done an excellent job to ensure that the fund operates effectively and correctly.

**THE EPA IS
STANDING ITS
GROUND ON
THE 1998
UPGRADE
DEADLINES.
DAVE WILEY
SPEAKS SOFTLY
BUT HE'S
CARRYING A BIG
STICK.**

releases," Wiley said. "The main cause for these leaking systems was external corrosion. Not a big surprise." Wiley emphasized that the upgrade deadline will not be extended. Tank owners will have had ten years to upgrade their UST systems which the EPA feels is sufficient time. Meanwhile, Wiley

David Wiley of EPA's Office of Underground Storage Tanks (OUST) discussed the 1998 upgrade deadline. By Dec. 22, 1998, all USTs must have spill and overfill prevention equipment, and corrosion protection. The upgrades were mandated because of the large problem with external corrosion of steel USTs which have caused numerous releases. "By the late 1980s, we had a quarter million confirmed

offered some strategies for how regulators can help the regulated community comply with the 1998 deadlines.

- Focus on facilities that are least likely to come up with compliance on their own. Provide them with incentives.
- Regulators should use inspections to educate the community about the upcoming deadlines and to gather information about where they are in the process. "In New Mexico, you're lucky because you've got a good field presence which is an excellent opportunity for these activities to go on."
- Finally, track compliance to see how everyone is doing as 1998 approaches.

Wiley concluded with an important message that tank owners and operators will hear repeated over and over again: Start now to upgrade. Do not wait until the last minute.

**SPILLS HAPPEN,
SAYS TANK OWNER
JIM SHEPHERD
WHO ADMITS HE'S
HAD HIS SHARE.
HE EXPECTS HIS
EARLY
UPGRADING WILL
TRANSLATE INTO
A SPILL-FREE
FUTURE.**

Jim Shepherd, president of Ever-Ready Oil, urged tank owners and operators to learn -- better yet, memorize -- the Underground Storage Tank Regulations and follow three rules: "Stay in compliance, stay in compliance, and stay in compliance." Shepherd agreed with Dave Wiley that tank owners should start early on upgrade requirements. He cautioned tank owners not to try to beat the system. He said it's in

the tank owner's best interest to upgrade because upgrading is much cheaper than cleaning up a release. As for Shepherd's company, he says Ever-Ready is already 98 percent in compliance, "and the other two percent is on the way."

Teri McMillan is a Water Resource Specialist at the Roswell District Office.



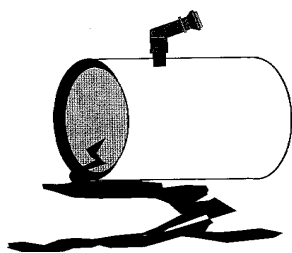
Marcel Moreau Talks Tank Management

by Harry L. Gunn

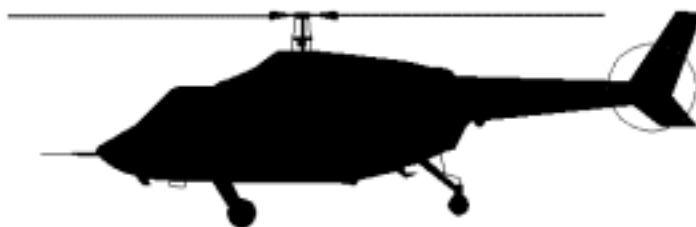
Hailing from Portland, Maine, Marcel Moreau is a familiar face in the New Mexico UST community. He has brought his expertise on underground storage tank management to this state many times, usually for the benefit of the UST Bureau's prevention and inspection staff. He also brings a well-organized and interesting presentation. The Bureau saw the UST conference as a great opportunity for Moreau to share his approach and expertise on the subject with owners, operators, installers, and equipment manufacturers.

During the morning session, Moreau covered the rules, deadlines and methods for meeting upgrade requirements. David Wiley of EPA's Office of Underground Storage Tanks was in attendance and assured everyone one more time that the compliance date for corrosion protection, along with other upgrade requirements, will be Dec. 22, 1998, no matter what. Moreau covered all of the acceptable methods of compliance with the regulations in detail and, with audience participation, expanded the discussion into one on the practical use of the various devices for tank and piping upgrades, overfill protection and spill containment.

In the afternoon session, Moreau explained his release detection compliance checklist for owners and operators. The checklist was straightforward and complete, covering each of the various methods of leak detection for tanks and piping.



MAKING THE ROUNDS, SHELDA SPOTS TROUBLE BELOW



Moreau stressed the importance of diligent maintenance for all the new electronic methods of leak detection. He warned operators of their role in this maintenance. If a red light comes on the panel or a buzzer sounds or a message is displayed on the crystal display on the console of a monitoring system, they need to be familiar enough with the equipment to find out why the light is coming on, and not just turn the leak detector off.

Moreau listened while an animated audience discussed mechanical and electronic automatic line leak detectors. A manufacturer's representative explained his company's product certification and policy of testing its detectors. Moreau reminded everyone that all these devices must be tested once a year using the manufacturer's recommended method.

Moreau ended his presentation with a slide of an Apache helicopter, getting a laugh when he described it as Shelda Sutton-Mendoza's latest weapon in the UST Bureau's prevention/inspection arsenal. Well, maybe without the gun pods...

Harry Gunn is a Water Resource Specialist at the Clovis Field Office.

Pamphlets available from the UST Bureau:

- Don't Wait Until 1998 -- Spill, Overfill, and Corrosion Protection for Underground Storage Tanks
- Release Detection Requirements for Underground Storage Tank Systems

Call 827-2910 for copies.

The Reimbursement Program: What's In, What's Out

by Kal Martin



When Kathy Garland began her presentation on paperwork revisions for the Reimbursement Program, she wondered aloud if there shouldn't be some sort of barrier between her and the audience. Chicken wire, she suggested. Mercifully the attendees had been waiting for these changes for some time now. Reimbursement gets easier all the time, thanks to the open communication between owners/operators and the UST Bureau.

The UST conference was an opportunity for the UST Bureau to present new and upcoming changes in the Reimbursement Program. Adoption of these changes is a result of concerns expressed by tank owners and contractors, the UST Committee, and the UST Bureau for preserving the integrity of the Corrective Action Fund, for expediting payments, and for showing accountability for claims paid. The major revisions presented during the reimbursement session included:

1. **Modified Cost Detail Forms.** The forms are modified to four pages, expanding each category (Professional Services, Expenses and Subcontractor) to a full page and including a summary page. There will be space on the form to separate taxable and non-taxable expenses.
2. **Claim Form Instructions.** Claim form instructions are added to the reimbursement application package to assist claim preparation.
3. **Standardized Invoicing Format.** New formats include all information that claim auditors need to process claims. These new formats will be mandatory.
4. **Fee Schedule Revisions.** Modifications are proposed to the existing Contractor Fee Schedule for cost control.
5. **Assent to Audit.** Claim applicants sign a consent on the affirmation page for the Bureau to audit financial documentation of claimants and contractors.

The new forms, standardized invoicing, and claim instructions are designed to streamline the payment process. The faster claims are reviewed and processed, the faster claims are paid. UST Bureau benefits from the new forms and standardized invoicing formats because they reduce administrative costs in claim review, simplify the payment process, expedite claim processing and payments, and provide information transferrable to other NMED forms.

The Bureau will be mailing these revisions and formats to tank owners and consultants. You can also contact your project manager or the Reimbursement Program in Santa Fe.

Kal Martin is a Water Resource Specialist at the District I office in Albuquerque.

Long-awaited Revisions to Contractor Fee Schedule on the Table

by Kal Martin

UST Bureau Chief James Bearzi presented the proposed revisions to the Contractor Fee Schedule at the reimbursement session of the UST Conference and Trade Show. These draft revisions were presented to the UST public for the first time.

The revisions are a result of discussions with the UST public throughout the year. Many of the changes are included to encourage RPs and contractors to perform faster corrective action with less administrative cost. A summary of the changes are as follows:

- Two labor categories at \$10 and \$20 per hour have been added.
- In the Professional Services category, personnel who performed certain tasks prior to Sept. 1, 1993, but who don't meet education and experience requirements, will have an opportunity to appeal.
- Proposes an equipment lease fixed rate of four percent for specialized remediation equipment which costs more than \$500. The Department will

pay four percent per month of actual cost for the life of the equipment.

- Proposed revision to travel policy to qualify portal-to-portal travel.
- The Department will not pay for excavation and/or disposal without prior approval. No more dig-and-hauls in the first 72 hours.
- Direct Push technology allowed and encouraged for expedited site assessment.
- Fixed fee and pay-for-performance payment methods to encourage innovation and technical efficiency in site investigation and remediation.

Bearzi fielded a number of questions and comments regarding the revisions. Some of these concerns will be incorporated in the final fee schedule document.

Kal Martin is a Water Resource Specialist at the District I office in Albuquerque.



BUREAU STAFF JOHN COCHRAN (C.), AND TERI McMILLAN (R.) TAKE A BREAK FROM THE BUREAU'S BOOTH AT THE TRADE SHOW TO CHAT WITH CONTRACTOR JEFF FIREBAUGH (L.) OF GCL ENVIRONMENTAL SERVICES. MORE THAN 40 EXHIBITORS DISPLAYED THEIR SERVICES OR TECHNOLOGIES AT THE TWO-DAY SHOW.

Expedited Site Assessments: When the Hare Beats the Tortoise

by Randall Ferguson

WHEN IT COMES TO SITE ASSESSMENTS, REGULATORS AND CONSULTANTS ARE FINDING THAT GETTING THE JOB DONE FAST NOT ONLY SAVES MONEY, BUT PRODUCES A MORE ACCURATE PICTURE OF THE SITE. NEW TECHNOLOGY AND NEW ATTITUDES ARE ALLOWING CLEANUPS TO GET UNDERWAY IN A HURRY.



typical site investigation includes soil

borings, monitoring wells, sampling, laboratory turnaround times and a lengthy report preparation and review process. The initial site investigation does not always fully define the limits of the contamination and additional operations are necessary. This



could result in a greater risk to the environment, present legal problems, and add to the regulatory burden. Cost, time and inefficiency are potential drawbacks to conventional techniques.

According to Anna Richards, Manager of the UST Bureau's Remedial Action Program, there is an average of one new release per day in New Mexico. Currently there are 477 sites in the investigation stage and 213 sites in the clean-up or remediation stage. At some sites, investigations have taken up to two years. "The state wants to see sites move into remediation more quickly," Anna said.

New and improved technologies for site investigations have evolved to aid in faster, cheaper and better-planned site assessments. Jeff Brown, guest speaker at the conference and Senior Associate with Land Tech Remedial, discussed a site in New

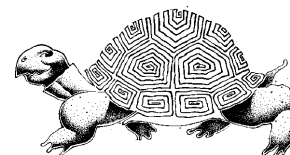
Jersey where the original site investigation consisted of conventional techniques which took 2.5 months. Cost was roughly \$12,000, which equated to 12 samples at \$1,000 each, and the site investigation was incomplete. Jeff's company, with no knowledge of the previous findings, was contracted to perform a soil gas survey and in 1.5 days the plume was contoured in the field. Five temporary monitoring wells for groundwater were installed and subsequently tested with an onsite mobile gas chromatograph. This resulted in a three-day expedited site investigation with the report delivered in two weeks. Cost was roughly \$15,000, which equated to 50 samples at \$300 each, with the remediation plan delivered one month later.

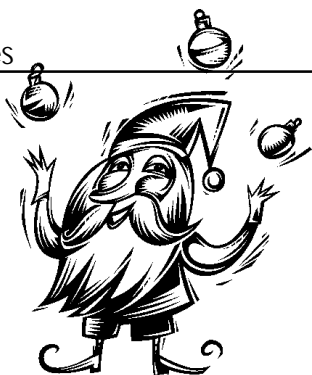
Curt Fahnestock, the second conference panelist and Project Manager for Burlington Environmental, discussed a site in Farmington where a GEOPROBE system was used. This type of system has hydraulic or percussion type tools with small diameter drive points or temporary sampling points to recover soil and/or groundwater sample data. The approach proved beneficial given the limited space access, and saved months and costs on the site characterization.

In summary, the benefits of these technologies, sometimes called Direct Push, include quicker analytical field data acquisition of soil and/or groundwater samples, lower costs and a more timely determination of the extent of contamination. Because decision time is cut drastically, several site investigation functions can be covered under a single workplan or budget proposal, thereby cutting down on regulatory review and purchase order approval from an owner/operator.

At this time, there are few providers of this service in New Mexico. Anna Richards pointed out that out-of-state travel can be incorporated into a lump-sum, fixed-fee workplan which frees the tank owner from some fee schedule limitations.

Randall Ferguson is a Water Resource Specialist at the UST Bureau in Santa Fe.





Pay-For-Performance

by Rita Alexander

The Corrective Action Fund has been funding cleanups for more than two years now. With it has come a deluge of paperwork in the form of workplans, budgets and invoices, which is often difficult for Bureau staff, not to mention the consulting firms, to keep up with. In an effort to reduce the amount of time project managers spend processing invoices, as well as time spent by consultants preparing them, the Bureau is encouraging some alternative approaches to contracting.

The Bureau sees several types of contracts, ranging from the traditional time-and-materials contract to the innovative turnkey performance-based contracts. These approaches are often applied to the workplan. Whatever the case may be, contracts and workplans are necessary. Without them, work would not happen and sites would never be cleaned up.

The time-and-materials contract results in the consultant getting paid for individual items. Rate tables usually apply. The advantages of this type of contract is that the consultant doesn't have to guarantee his work, and the responsible party (RP) and regulatory agency will have control over the proposed cost to the most minute detail. The disadvantages are that the RP and the regulatory agency do not have a guarantee that the job will be completed, and the consultant, RP, and regulatory agency have a mountain of paperwork in the form of invoices and workplans to prepare and review.

In unit-cost-based contracts, the consultant is paid for units, e.g., X dollars per monitoring well or boring. Rate tables usually apply. The big advantage to this type of contract is that there is now some guarantee that part of the job will be completed for a certain price. For example, while not guaranteeing that the investigation will be completed, the consultant guarantees that they will install a monitoring well for X dollars. Costs are therefore somewhat controlled. Another advantage to this contract is that because the work is approved at the unit level, the costs may be invoiced as such, cutting out some detail and reducing some of the administrative time spent preparing and reviewing workplans and invoices.

Task-based performance contracts pay for performance at the task level. An example would be the following: upon completion of the hydrogeologic investigation, as per the regulations, the consultant will receive X dollars. Payment would be made after the submittal and approval of a deliverable, i.e., the hydrogeologic investigation report. Rate tables may or may not apply and costs are controlled for the specific task but not overall. Costs associated with these contracts are approved on a larger scale than unit-cost-based contracts. As a result, there is a guarantee that more work will be completed and you get a still greater reduction in administrative time.

The turnkey performance-based contract contains the most guarantees. In these contracts, the consultants receive payments to reach certain agreed upon cleanup levels. Payments are made when deliverables are submitted or proof is presented that a cleanup level has been reached. A sample payment schedule might be:

| Deliverable | % of total cost |
|-------------------------------|------------------------|
| Approval of workplan: | 15% |
| Submittal of as-built report: | 10% |
| 25% cleanup: | 5% |
| 50% cleanup: | 10% |
| 75% cleanup: | 10% |
| 90% cleanup: | 20% |
| 100% cleanup: | 30% |

The RP and regulatory agency have the guarantee that cleanup will be achieved and the consultant has the incentive to expeditiously remediate the site. Since this type of contract is approved at the performance level, there is almost no paperwork and very little administrative time expended. The costs associated with these contracts are truly controlled.

It is the hope of the Bureau that consultants and RPs will seriously consider the benefits of unit-, task- or performance-based contracting. If more of these types of contracts were in use, less administra-

tive time would be required, allowing technical staff to work in their area of expertise, i.e., investigation and remediation of hydrocarbon contamination, ultimately resulting in expedited site investigations and cleanups — everybody's goal!

Rita Alexander is a Water Resource Specialist at the District I office in Albuquerque.

Regulators, owners, and consultants put their heads together and reveal their PFP plan.

Gasoline contamination is discovered on what is now a vacant lot. James Bearzi, leading the conference workshop on pay-for-performance contracting, divides the audience into six groups. The groups, each with at least one tank owner, contractor and regulator, have a job to do: Develop a performance-based workplan and budget to clean up the site. Here's what they know: groundwater sampling has revealed benzene greater than 10 ppb over 10,000 square feet with the maximum benzene concentration measured at 10,000 ppb. There's up to a foot of free-product over 1,000 square feet. Depth-to-water is 40 feet. Hydraulic gradient is 0.01; flow is 0.1 ft/day. There's vadose-zone contamination. After a half hour of intense discussion, the groups present their plans to the Bureau.

The reporter for the first group says they're going to put it out to bid. "We're going to tack on a timeline of three years and let the consultant choose the scope." The group developed a payment schedule whereby the consultant would be paid a certain percent for each cleanup level. Bearzi says he wants more. "I still don't know how much this is going to cost," he says. "And they didn't figure out a technology to use." What Bearzi does like is that they have smaller payments for the first 50 percent of reduction, and the payments become larger the further the reduction goes. "You want to leave enough money in abeyance to keep the consultant on site. You give him an incentive to knock out that last little bit."

The second group's plan has a \$300,000 price tag. The first \$100,000 is up front so the contractor can get started, the second is \$100,000 paid on line, and the third is for percent removal of contaminants. "As an owner, I'm also authorizing direct pay, so I'm out of the loop as far as reimbursement goes." The reporter's remark gets a laugh, but Bearzi reminds everyone that "if the fund goes belly up, or if they change the legislation,

you're still on the hook. Also, you contractors who have complaints with direct-pay, you may want to stick something in the contract which says, 'Client, you have to pay me whether the state pays or not.'"

In Group 3's \$300,000 plan, the contractor gets paid 33 percent up front and another 15 percent after installation of the reclamation system, with the rest paid for at free product and dissolved phase remediation levels. They don't indicate a timeline, which Bearzi says the contractor and the state would want. The fourth group comes up with aggressive free product removal for \$400,000 over a three-year period.

Like Group 1, the fifth group puts the cleanup out to bid. "I got three bids from a low of \$240,000 to clean up to 10 ppb to a high of \$356,000. They would all clean up to those levels, but they wanted their money a little bit differently." The reporter says the owner chose the consultant willing to start for the least money up front.

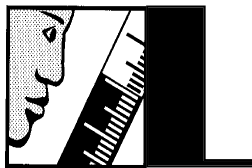
The last group reports the lowest price and the shortest timeline: \$200,000 for a two-year contract with a 1-year extension for monitoring. The consultant will receive \$75,000 on signing the contract, and \$25,000 upon installation of the system. This group also settled on sums to pay for achieving percentages of cleanup to standards. "We're going to monitor the vapors to 100 ppm. We're going to concentrate on free product recovery first, and then move to sparge-and-vent," the reporter says. "This is a good bargain — you should get hold of this."

Bearzi wraps up the workshop with compliments to the groups. He says to keep in mind that site characterization becomes extremely important if PFP-based contracts are to be considered. And how do regulators know they are getting good value? The UST Bureau will still want contractors to submit fairly detailed plans, but it has enough experience with cleanups to assess the value of the proposal.

SIR: release detection for both tanks and piping

by Mark Coffman

If you're shopping for leak detection, you have an array of choices. Statistical Inventory Reconciliation is one of them. The Bureau does not endorse one method over another, but because SIR is new, people are asking about it. One of the conference panels addressed some of those questions.



Leak detection methods for both tanks and piping can be complex and difficult to understand. To do each method properly takes skill and training. Until

recently, owners and operators had to use one method for tanks and another for piping. Now, technologies are available that do tank and piping release detection together.

Inventory control is one method of leak detection for tanks only and is a temporary method. It is relatively inexpensive and easy to do once set up properly. You may, however, only use inventory control until December 1998, or ten years after you install new tanks or upgrade existing tanks, whichever date is later.

There is good news, though, for users of inventory control. It is called statistical inventory reconciliation, also known as SIR.

A SIR vendor takes your regular inventory control data and analyzes it using a sophisticated statistical analysis computer program. The program creates graphs using the parameters you supply. A statistician analyzes for correlations in the data that could indicate a leak.

SIR was the subject of a lively and enlightening panel discussion at the conference. The panel included two representatives of the SIR industry, Robert Gill of USTMAN, Inc. and Warren Rogers of Warren Rogers & Associates, as well as David Wiley

from the EPA Office of Underground Storage Tanks and Charley Brewer of Brewer Oil Company and member of the state UST Committee.

SIR is a permanent release detection method and can also be used for piping release detection. Besides continuing your inventory control, you only need to install a line leak detector on every pump (if you have pressurized piping) and have them tested annually.

Both Rogers and Gill emphasized the need for precise inventory control because they use your inventory records to analyze your data. You've probably heard the expression "garbage in, garbage out" used by computer programmers. If your data is not good (e.g., you don't stick your tank properly), or you have any of the other problems addressed below, you will limit the value of the analysis performed by the SIR vendor.



You must keep good inventory in order to meet the probability of detection (PD) and probability of false alarm (PFA) criteria established in the regulations. If the SIR vendor cannot meet the 95 percent PD and five percent PFA requirements for your data, then you do not have proper release detection and are subject to fines. You must send your inventory data for all tanks to the vendor monthly and receive the vendor's report in a timely manner (i.e. one month from submittal date). If you get a report indicating an inconclusive result, you must use another method of release detection for that month.

What does all this cost? For the average gas station of three tanks at \$30 per tank per month, the cost amounts to \$90 per month or \$1,080 per year. There's also the charge for the line leak detector tests if you have pressurized piping.

Rogers said that in the early days SIR had its share of inadequacies. He added that vendors are constantly reevaluating and perfecting their methods of analysis.

Here are some guidelines if you use SIR as your release detection method. These same guidelines will help you prevent inconclusives.

- Use a good tank gauge stick and tank chart calibrated to the nearest one-eighth inch.
- Measure for the presence of water in the tank at least once a month.
- Make sure you stick the tanks before and after each delivery.
- Make sure that all your dispenser meters are calibrated to local standards.
- Take stick readings every day you operate your tanks.
- Watch out for a phenomenon known as data dropout. Sometimes data from the totalizers does not always make it to the point-of-sale (POS) unit. The POS is the electronic device that keeps track of metered sales for the clerk inside the building.

You can find the requirements for inventory control in the UST regulations (§603(a)).

Rogers said that if you use automatic tank gauges (ATGs) to conduct inventory, they must be properly calibrated and programmed. He said that 40 percent of all inventory data received by his company is ATG data, but that 80 percent of the gauges were not working properly (i.e. not properly calibrated or programmed).

Rogers elaborated on common errors in ATG data.

- Tank tilt. The assumption generally made to reduce errors due to tank tilt is that overage on one end of the tank is equal to shortage at the other end. To minimize this error, installers will install the probe as close to the center of the tank as possible. While this action does minimize error due to tank tilt, it does **not** eliminate it. This assumption does not work well for cylindrical tanks, only rectangular ones, but rectangular tanks are not the norm.

- UL allowances for tank dimensions. Another possible source of error in programming tank gauges is the allowance by Underwriters Laboratories (UL) of up to 5 percent deviation in any or all of the dimensions of an underground tank. In

other words, any or all three of the dimensions of your tank may be up to 5 percent longer or shorter than UL specifications. Therefore it may be best to develop a strapping chart (tank chart) for each tank individually over time using your SIR data to help you more closely define the dimensions of your particular tank(s).



Rogers and Gill agreed that SIR can easily detect most of these errors. The graphs of the data show obvious patterns that

indicate what the source of the error is. Rogers said that delivery errors, miscalibrated meters, tank tilt, and volume/temperature change patterns all have very distinctive graph inflections and are easy to identify.

According to Rogers, about 80 percent of all leaks found by his company were visible at a site inspection. The majority of these could be detected by doing line tests. Not surprisingly, most leaks were found to occur in the flex connectors and/or dispensers.

Some members of the audience expressed interest in purchasing their own in-house SIR system. Possible, yes, according to Rogers, but the cost may be prohibitive for smaller operations. One vendor sells the software package for approximately \$15,000. That's a lot of tank and line tightness tests! You must also be sure to check with your state environmental office. They may have some additional requirements to use the method in-house. For instance, the Texas program requires that you hire a full-time, on-staff, statistician if you use an in-house SIR system. Some states also require owners/operators to train the people who will be doing the tank-sticking to assure they know how to do it properly.

There's a lot to think about when deciding on how to do your release detection. Different methods have different advantages. The main advantages of the SIR method are:

- you can continue using inventory control to obtain your data,
- inventory control is inexpensive, and
- SIR works as your release detection method for both tanks and piping.

Mark Coffman is an Environmental Scientist at the District I office in Albuquerque.

Risk-Based Corrective Action

BY *DANA BAHAR*



KEITH FOX, FLANKED BY PANELISTS (L-R) DOLORES HERRERA, HARVEY DOVE, AND LIZ SCAGGS, EXPLAINS RBCA TO THE AUDIENCE.

RISK ASSESSMENT IS AN APPROACH IN WHICH LIMITED RESOURCES FOR CLEANUPS ARE SPENT WHERE THREAT TO HUMAN HEALTH AND THE ENVIRONMENT IS GREATEST.

Keith Fox, District I Program Manager, led the discussion on risk-based corrective action. He defined RBCA as a corrective action strategy that categorizes sites according to risk, and moves all sites toward completion using appropriate levels of action and oversight.

The Theory

Harvey Dove, member of the Risk Assessment Group of International Technology Corporation, explained what constitutes a risk and what a risk assessment entails. In order to define a risk, three components must be identified: concentration of contaminant, pathway, and receptors. An UST without a leak is not a risk; an UST with a leak may or may not be a risk depending on the level of contamination (e.g., benzene level above standards), the pathway (e.g. transmissivity of medium) and the presence of a receptor (e.g., drinking water supply).

Dove then presented the stages in developing a risk assessment. He explained what data are necessary, from where the data is gathered, the limitations

to the data, and how the data is manipulated. General terms considered in a risk assessment are: release scenario, source term, constituent transport (i.e., phase and mode of transport), exposure assessment (i.e., receptor location and exposure pathway--inhalation, ingestion, absorption or injection) and risk characterization (i.e., toxicity and estimated intake). Uncertainties associated with the above terms are: 1) how to define the receptor population--one plant or one human; 2) how complete is the emissions database; 3) how to calculate the fate and transport estimates--do we understand the mobility of the contaminant; 4) how to determine exposure estimates; 5) how reliable is the available toxicological data and risk characterization -- most toxicological data is based on experiments on rats; and, 6) how to account for complex interaction of unknowns. Dove emphasized that risk assessment is a conservative calculation in that the worst is generally assumed. He also emphasized that risk assessment is not the same as risk-based corrective action.

Dove referred interested parties to the following documents:

ASTM E538-94, 1994
 Washington Model Toxic Center Act, 1990
 Texas Risk Reduction Standards, 1993

The Practice

Liz Scaggs, geologist with the Texas Natural Resource Conservation Commission Petroleum Storage Tank Division, introduced the TNRCC's RBCA program. TNRCC adopted the RBCA program primarily to resolve monetary concerns without compromising the health of the public or the environment. To date approximately \$2.9 billion have been spent cleaning up leaking underground storage tank sites. Out of 10,000 reported sites, 5,400 have affected groundwater and 9,800 are active sites. Projected savings using RBCA are estimated to be about \$163,000 per case.

The Texas RBCA program has two methods of determining cleanup levels. The first, Plan A, is a screening evaluation of UST sites. Plan A considers conservative assumptions regarding potential human exposure and site-specific factors. Plan A, however, is based on fewer site specific factors and requires less rigorous assessment than Plan B. Plan B requires the completion of a limited risk assessment to evaluate current and potential human health risks and short-term and long-term fate of contaminants. Plan B allows for more flexibility in site cleanup but requires more rigorous risk assessment and regulatory review.

Scaggs referred interested parties to the following documents:

TNRCC Guidance Manual for Risk Assessment, 1994
 TNRCC Risk-Based Corrective Action for Leaking Storage Tank Sites

The Circumspect

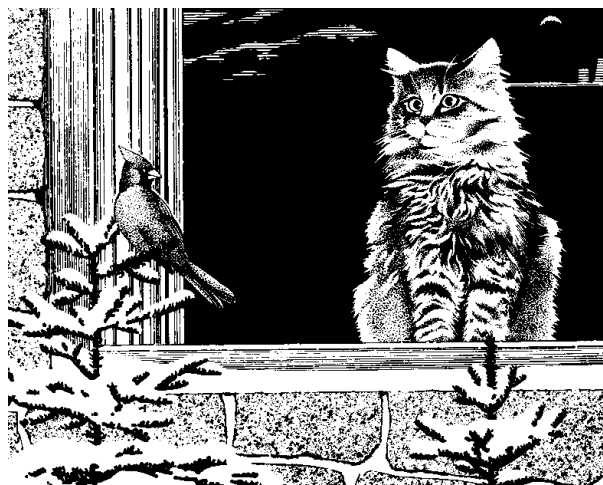
Dolores Herrera, Executive Director of the San Jose Community Awareness Council here in Albuquerque, began her discussion by asking how one's perspective of RBCA may change if the one statistical person per million who has cancer is their mother, child, or neighbor. Herrera also asked regulators and consultants not to underrate the wealth

of historical information in the community they are working in.

Herrera distinguished between the scientists' perspective as the "analytical way" and the community's perspective as the "people way." Communities are concerned about health, financial problems, and the safety of their members and workers. The people in communities remain there long after the scientists have come and gone.

Many of the questions raised by the audience pertained to how RBCA may be incorporated into the New Mexico UST regulations. Keith Fox said that for now a variance is the only avenue. He added that no variance can be given to alter the regulatory standards, but that a request to vary the technology is appropriate. For example, a less aggressive technology to include the monitoring the rate of biodegradation may be considered. Liz Scaggs said that in Texas, RBCA was primarily used to set cleanup levels on a site-by-site basis.

Dana Bahar is a Water Resource Specialist with the UST Bureau in Santa Fe.



SENSING DANGER, CARL CARDINAL DOES A QUICK RISK ASSESSMENT.